**Completely Randomized and Randomized Block Designs Examples – 2 Trts**

**Design 1: Completely Randomized Design**

**Method 1: Independent Samples t-test**





**Example:** Experiment was conducted to test effect of participation in meal preparation on caloric intake in children on subsequent meal. A sample of 47 randomized so that 25 participated and 22 did not participate in meal preparation. Response was total calories consumed in subsequent meal. Treatment Conditions and summary data (sample size, mean, standard deviation) are given below.



* Does the assumption of equal population variances seem reasonable?
* Compute the pooled (sample) variance sp2.
* Conduct the test of H0: = 0 vs HA: ≠ 0 at  = 0.05 significance level
* Obtain a 95% Confidence Interval for 
* Using the R Program on the class website, conduct the test, and obtain the 95% Confidence Interval using both direct computations and the **t.test** function. Confirm your calculations agree with the computer outputs.

**Method 2: Linear Regression**



* Give the population means for treatments 1 and 2 in terms of 
* Interpret the parameters  in terms of 
* Using the R program on the class website, use the regression approach to test:

 H0: = 0 vs HA: ≠ 0 and obtain a 95% Confidence Interval for 

**Design 2: Randomized Complete Block Design**

**Method 1: Paired t-test**



**Example:** A small pilot-study was conducted to compare the daily amount of water drank by cats under two conditions: flowing water (Trt 1) and still water (Trt 2). Each cat (block) was observed under each condition, and an average daily water amount *y* was observed for each condition.



* Conduct the test of H0: = 0 vs HA: ≠ 0 at  = 0.05 significance level
* Obtain a 95% Confidence Interval for 
* Using the R Program on the class website, conduct the test, and obtain the 95% Confidence Interval using both direct computations and the **t.test** function. Confirm your calculations agree with the computer outputs.

**Method 2: Linear Regression**



* Using the R program on the class website, use the regression approach to test:

 H0: = 0 vs HA: ≠ 0 and obtain a 95% Confidence Interval for 

**Data Sources:**

K. nan der Horst, A. Ferrage, A. Rytz (2014). "Involving Children in Meal Preparation," *Appetite*. Vol. 79, pp.18-24.

C. Pachel and J. Neilson (2010). "Comparison of Feline Water Consumption Between Still and Flowing Water Sources: A Pilot Study," *Journal of Veterinary Behavior*, Vol. 5, pp. 130-133.